

Enhancing Understanding and Engagement in Linear Motion Using 7R- Based Module

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Abstract : This action research was implemented to enhance the teaching of linear motion and to improve students' conceptual understanding and engagement using a developed 7R-based module called 'module on vectors and one-dimensional kinematics' (MVOK). MVOK was validated in terms of objectives, contents, format, and language used, presentation, usefulness, and overall presentation. The validation process revealed a value of 4.7 interpreted as 'Very Acceptable' with a substantial agreement (0.60) from the validators. One intact class of 46 Grade 12 STEM students from one of the public schools in Paranaque City served as the participants of this study. The students were taught using the module during the first semester of the academic year 2019-2020. Employing the mixed-method approach, quantitative data were gathered using pretest/posttest, activity sheets, problem sets, and survey form, while qualitative data were obtained from surveys, interviews, observations, and reflection log. After the implementation, there was a significant difference of 18.4 on students' conceptual understanding as shown in their pre-test and post-test scores on the 24-item test with a moderate Hake gain equal to 0.45 and an effect size of 0.83. Moreover, the scores on activity and problem sets have a 'very good' to 'excellent' rating, which signifies an increase in the level of students' conceptual understanding. There also exists a significant difference between the mean scores of students' engagement overall ($t = 4.79$, $p = 0.000$, $p < 0.05$) and in the dimension of emotion ($t = 2.51$, $p = 0.03$) and participation/interaction ($t = 5.75$, $p = 0.001$). These findings were supported by gathered qualitative data. Positive views were elicited from the students since it is an accessible tool for learning and has well-detailed explanations and examples. The results of this study may substantiate that using MVOK will lead to better physics content understanding and higher engagement.

Keywords : conceptual understanding, engagement, linear motion, module

Conference Title : ICPEL 2022 : International Conference on Physics Education and Learning

Conference Location : New York, United States

Conference Dates : August 08-09, 2022